MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

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View scanned well log (8/7/2009 2:33:23 PM)

Site Name: ANACONDA ALUMINUM #5
GWIC Id: 85180

Section 1: Well Owner(s)

1) ANACONDA ALUMINUM COMPANY (MAIL)

COLUMBIA FALLS MT 59912 [10/28/1954]

Section 2: Location

Township	Range	Section	Quarter Sections
30N	20W	2	SW¼ SW¼ NE¼ SW¼

County: FLATHEAD
Geocode:

Latitude	Longitude	Geomethod	Datum
48.389249	114.126356	TRS-SEC	NAD83

Ground Surface Altitude	Method	Datum	Date
3123			

Addition **Block** **Lot**

Section 3: Proposed Use of Water

INDUSTRIAL (1)
PUBLIC WATER SUPPLY (2)

Section 4: Type of Work

Drilling Method: PICK & SHOVEL
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Thursday, October 28, 1954

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
0	137.9	16				STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
137.5	162	6			JOHNSTON 16IN SC

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 171
Static Water Level: 106
Water Temperature:

Pump Test *

Depth pump set for test _ feet.
903 gpm pump rate with _ feet of drawdown after 84 hours of pumping.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 115 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

112OTSH - GLACIAL OUTWASH (PLEISTOCENE)

From	To	Description
0	30	ROCK AND GRAVEL
30	38	SAND & SMALL GRAVEL
38	48	SAND & SMALL GRAVEL
48	54	GRAVEL & SAND
54	56	CLAY & GRAVEL
56	60	COARSE SAND & SMALL GRVEL
60	64	GRAVEL & CLAY
64	70	LARGE ROCK GRAVEL AND SAND
70	80	MEDIUM ROCK GRAVEL & SAND
80	101	COARSE SAND AND SMALL ROCK
101	106	COARSE GRAVEL
106	112	GRAVEL & SAND
112	133	ROCK SAND & GRAVEL
133	136	ROCK GRVEL SAND & CLAY
136	139	GRAVEL & SAND

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: LAYNE-MINNESOTA
License No: -
Date Completed: 10/28/1954

Site Name: ANACONDA ALUMINUM #5
GWIC Id: 85180
Additional Lithology Records

From	To	Description
139	140	GRAVEL & CLAY
140	146	GRAVEL SAND ROCKS & CEMENTED GRAVEL
146	147	GRAVEL & CLAY
147	151	GRAVEL SAND & CEMENTED GRAVEL
151	152	GRAVEL & CLAY
152	159	SAND & SMALL GRAVEL
159	168	ROCK GRAVEL & SAND
168	171	SAND & GRAVEL

029 30N 20W 02CAD FLATHEAD

T. 30 N. R. 20 W. 2

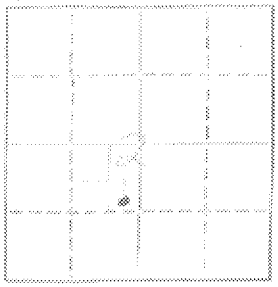
County Flathead

MONTANA BUREAU OF MINES AND GEOLOGY

Butte, Montana

PW4/85181

WATER WELL LOG



Owner Anaconda Aluminum Company Address Columbia Falls, Mont.

Driller Layne Minnesota Co. Address Billings, Mont.

Date Started July, 1956 Date Completed Aug. 14, 1956

Location: Sec. 2 T. 30 N. R. 20 W ¼ sec. NE¼ SE¼

Type of well Dug 26" Cased 16" Equipment used Mck & Shovel
(Dug, driven, bored, or drilled) (Cable tool, rotary, other)

Water use: Domestic ☐ Municipal ☐ Stock ☐ Irrigation ☐

Industrial ☒ Drainage ☐ Other:

PH

Casing: 2232.67 ft. to 2285.26 ft. Type Steel Size 16"

Casing: ft. to ft. Type Size

Casing: ft. to ft. Type Size

Perforated or Screened: Ft. 2285.26 to ft. 2294.42 Ft. to ft.

Type of screen or perforations Johnston 16" Screen

Static water level, for non-flowing well: 2017.34 (River El. 3016.0) feet.

Shut-in pressure, for flowing well: lb./sq. in. on (date)

Pumping water level 3022.27 feet at 1595 gal. per min.

How tested: By Continuous Pumping

Length of test 7 Days

Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

Hole No. 1 14 Permanent Well #4

(over)

W185181

Log of Well

Depth, feet From	Depth, feet To	Description of Material Drilled
3132.5	3106.5	Coarse Rock & Gravel
3104.5	3100.5	Sand and Gravel
3100.5	3097.5	Clay and Gravel
3097.5	3083.5	Gravel and Sand
3083.5	3072.5	Clay and Gravel
3079.5	3069.5	Clay and Rock
3069.5	3067.5	Gravel and Sand
3067.5	3064.5	Clay and Gravel
3064.5	3051.5	Rock and Gravel
3051.5	3040.5	Gravel & Sand
3040.5	3012.5	Fine sand, Clay, Gravel and Silt
3012.5	3007.5	Clay & Gravel
3007.5	2997.5	Silt, Clay & Gravel
2997.5	2991.5	Coarse Sand, Gravel & Boulders
2991.5	2970.5	Clay, Sand, & Gravel
2970.5	2966.5	1/2" to 4" Gravel
2966.5	2956.5	Fine & Coarse Sand & Silt
2956.5	2954.5	Fine Sand & Silt.

MONTANA WELL LOG REPORT

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Other Options

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View scanned well log (8/7/2009 2:33:40 PM)

Site Name: ANACONDA ALUMINUM #4
GWIC Id: 85181

Section 1: Well Owner(s)

1) ANACONDA ALUMINUM COMPANY (MAIL)

COLUMBIA FALLS MT 59912 [08/14/1954]

Section 2: Location

Township	Range	Section	Quarter Sections
30N	20W	2	NE¼ NW¼ SE¼ SW¼

County: FLATHEAD
Geocode:

Latitude	Longitude	Geomethod	Datum
48.3886	114.1219	UNKNOWN	NAD27

Ground Surface Altitude	Method	Datum	Date
3130			

Addition: Block: Lot:

Section 3: Proposed Use of Water

INDUSTRIAL (1)
PUBLIC WATER SUPPLY (2)

Section 4: Type of Work

Drilling Method: PICK & SHOVEL
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Saturday, August 14, 1954

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
0	154.2	16				STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
154.2	176	16			JOHNSTON 16IN SC

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 185
Static Water Level: 122
Water Temperature:

Pump Test *

Depth pump set for test _ feet.
1508 gpm pump rate with _ feet of drawdown after 168 hours of pumping.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 127 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

112ALVM - ALLUVIUM (PLEISTOCENE)

From	To	Description
0	35	COARSE ROCK & GRAVEL
35	39	SAND AND GRAVEL
39	42	CLAY AND GRAVEL
42	56	GRAVEL AND SAND
56	60	CLAY AND GRAVEL
60	70	CLAY AND ROCK
70	72	GRAVEL AND SAND
72	75	CLAY AND GRVEL
75	88	ROCK AND GRAVEL
88	99	GRAVEL & SAND
99	127	FINE SAND CLAY GRAVEL AND SILT
127	132	CLAY & GRAVEL
132	142	SILT CLAY & GRAVEL
142	148	COARSE SAND GRAVEL & BOULDERS
148	169	CLAY SAND & GRAVEL

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: LAYNE-MINNESOTA
License No: -
Date Completed: 8/14/1954

Site Name: ANACONDA ALUMINUM #4
GWIC Id: 85181
Additional Lithology Records

From	To	Description
169	174	1/2IN TO 4IN GRVEL
174	183	FINE & COARSE SAND & SILT
183	185	FINE SAND & SILT

029 30N 20W 02CBBB FLATHEAD

T. 30 N. R. 20 E. 2

County Flathead

MONTANA BUREAU OF MINES AND GEOLOGY
Butte, Montana

PW3/85183

WATER WELL LOG

Owner Anaconda Aluminum Company Address Columbia Falls, Mont.

Driller Layne Minnesota Company Address Billings, Montana

Date Started March 11, 1954 Date Completed March 15, 1954

Location: Sec. 2 T. 30 N. R. 20 W. ¼ sec. NE¼ SW¼

Type of well Dug 26' Cased 16" (Dug, driven, bored, or drilled) Equipment used Pick and Shovel (Churn drill, rotary, other)

Water use: Domestic ☐ Municipal ☐ Stock ☐ Irrigation ☐

Industrial ☒ Drainage ☐ Other:

Casing: 3000.85 ft. to 2999.96 ft. Type Steel Size 16"

Casing: ft. to ft. Type Size

Casing: ft. to ft. Type Size

Perforated or Screened: Ft. 2990.96 to ft. 2986.96 Ft. to ft.

Type of screen or perforations Johnson 16" Screen

Static Water level, for non-flowing well: 3016.36 feet.

Shut-in pressure, for flowing well: lb./sq. in. on (date)

Pumping water level 3000.9 feet at 262 gal. per min.

How tested: By Continuous Pumping

Length of test 126 Hr.s

Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

Hole No. L 10 Permanent Roll #2

(over)

M.85183

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Log of Well

Depth, feet From	Depth, feet To	Description of Material Drilled
3106.0	3064.0	Gravel, Rock and Clay Streaks
3064.0	3061.0	Gravel & Clean Sand
3061.0	3056.0	Gravel & Boulders
3056.0	3037.0	Rock, Sand, Some Sandy Clay
3037.0	3022.0	Coarse Gravel & Sand
3022.0	3020.0	Hard Fine Sand
3020.0	2996.0	Coarse Gravel & Sand
2996.0	2993.0	Fine Gravel & Sand
2993.0	2991.0	Coarse Rock & Sand
2991.0	2990.0	Cemented Rock & Sand
2990.0	2971.0	Gravel Rock & Sand

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Other Options

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Site Name: ANACONDA ALUMINUM
GWIC Id: 85183

Section 1: Well Owner(s)
1) ANACONDA ALUMINUM COMPANY (MAIL)

COLUMBIA FALLS MT 59912 [03/15/1954]

Section 2: Location

Township	Range	Section	Quarter Sections
30N	20W	2	NW¼ SW¼

County FLATHEAD **Geocode**

Latitude	Longitude	Geomethod	Datum
48.3911	114.128	UNKNOWN	NAD27

Ground Surface Altitude	Method	Datum	Date
3107			

Addition **Block** **Lot**

Section 3: Proposed Use of Water
INDUSTRIAL (1)

Section 4: Type of Work
Drilling Method: PICK & SHOVEL
Status: NEW WELL

Section 5: Well Completion Date
Date well completed: Monday, March 15, 1954

Section 6: Well Construction Details
There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
0	109.9	16				STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
106	119	16			JOHNSTON 16IN SC

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 135
Static Water Level: 90
Water Temperature:

Pump Test *

Depth pump set for test _ feet.
242 gpm pump rate with _ feet of drawdown after 118 hours of pumping.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 107 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log
Geologic Source
112ALVM - ALLUVIUM (PLEISTOCENE)

From	To	Description
0	42	GRAVEL ROCK AND CLAY STREAKS
42	45	GRAVEL & CLEAN SAND
45	48	GRAVEL & BOULDERS
48	69	ROCK SAND SOME SANDY CLAY
69	84	COARSE GRAVEL & SAND
84	86	HARD FINE SAND
86	110	COARSE GRAVEL & SAND
110	113	FINE GRAVEL & SAND
113	115	COARSE ROCK & SAND
115	116	CEMENTED ROCK & SAND
116	135	GRAVEL ROCK & SAND

Driller Certification
All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: LAYNE-MINNESOTA
License No: WWC-438
Date Completed: 3/15/1954

Kalispell   30N 20W 02 CB   Flathead 098222

HYDROMETRICS   TEST HOLE LOG   W7/TW19/13829   Helena, MT

State: Montana	County: Flathead	Project: Columbia Falls Aluminum Plant	Hole Name: TW-19
Legal Location: T 30N & 20W Sec. 2 Tract NW, SW	Descriptive Location: Southeast of BPA substation near fence		
Recorded By: John Ruth	Date Hole Started: 07/21/93	Date Hole Completed: 07/22/93 Driller: Frosty Groves	Drilling Company: Western Water Works
Drill Method: Air Rotary	Drilling Fluids Used: Air	Pilot Hole Diameter: 6"	Reamed Hole Diameter: 6"
Total Depth Drilled: 114'	Total Depth Reamed: --	Total Depth Cased Below G.S.: 113'	Diameter and Type of Casing: 6" steel
Weight or Gage of Casing: 6" steel .025 wall		Interval Perforated or Screened Below G.S.: 100 - 111'	
Target Aquifer: 1st water		Packer Type and Depth Below G.S.: --	

	YES	NO		Method Perforated or Screened		
Well Developed?	X			No Casing In Hole		Open Bottom Only
Well Test Pumped?	X			Slotted with Mill's Knife		Slotted with a Torch
Water Samples Taken?	X			Screened by Pulling Casing		Saw Cut
Materials Samples Taken?	X For logging only		X	Other (specify) Starwheel perforator		
E - Logs?		X				

Static Water Level: 90.85'   Date: 07/22/93

Measuring Point Description-Elevation: Top of steel casing   3118.92'   MP Height Above (+\-) or Below G.S.: +2.0

Well Annulus Completion Description: Steel casing to 113'. Bentonite placed around outside of casing.

Remarks: Drill 8-3/4" hole to 10' for reservoir for adding bentonite. Drive 6" casing and drill out inside of casing. Drive casing to 113'. Perforate steel casing and develop by air surging.

From	To	DRILLING LOG Geological, Drilling, Water Conditions and Sampling
0	5	SAND - Brown, fine to coarse-grained, poorly sorted, subangular to subrounded, unconsolidated, trace clay, trace fine gravel, moist.
5	10	SAND AND GRAVEL - Sand as above, 30% gravel, red, green, gray, black 1/4 to 2" subrounded, unconsolidated, gravel is composed of argillite and quartzite.
10	20	SAND AND GRAVEL - As above, very silty, dry, gravel 1/4 to 1".
20	25	SAND AND GRAVEL - Sand, brown, fine - coarse grained, silty, poorly sorted, subangular to subrounded, unconsolidated clayey in part, very moist, gravel green, red, black, subrounded 1/4 to 1 1/2" clasts, possibly a little perched water in this clayey zone.
25	30	SAND AND GRAVEL - As above, slightly moist.
30	40	SAND - Brown, fine-grained, 15% medium grained, silty, trace clay, well sorted, unconsolidated, 10% small subrounded gravel, gravel clasts are 1/4 - 1/2" in size, dry
40	60	SAND - Gray brown, fine to medium grained, very silty, moderately sorted, 10% coarse grained, 10% small gravel, subrounded, unconsolidated, dry, hit large cobbles at 60', cuttings from cobbles are green and red argillite.

PH

TBL-WP\TW-19-1.TBL\324-18-23\RAB

M13829

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MONTANA WELL LOG REPORT

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Other Options

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Site Name: COLUMBIA FALLS ALUMINUM PLANT * TW-19
GWIC Id: 136829

Section 1: Well Owner(s)

1) COLUMBIA FALLS ALUMINUM PLANT (MAIL)

COLUMBIA FALLS MT 59912 [07/22/1993]

Section 2: Location

Township	Range	Section	Quarter Sections
30N	20W	2	NW¼ SW¼

County: FLATHEAD

Geocode:

Latitude	Longitude	Geomethod	Datum
48.390622	114.129974	TRS-SEC	NAD83

Ground Surface Altitude	Method	Datum	Date

Addition: Block: Lot:

Section 3: Proposed Use of Water

MONITORING (1)

Section 4: Type of Work

Drilling Method: AIR ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Thursday, July 22, 1993

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	113	6				STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
100	111	6			STARWHEEL PERFS

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 114
Static Water Level: 92.25
Water Temperature:

Unknown Test Method *

Yield _ gpm.
Pumping water level _ feet.
Time of recovery _ hours.
Recovery water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

112ALVM - ALLUVIUM (PLEISTOCENE)

From	To	Description
0	5	SAND-BROWN FINE TO COARSE GRAINED POORLY SORTED SUBANGULAR TO SUBROUNDED UNCONSOLIDATED TRACE CLAY TRACE FINE GRAVEL MOIST
5	10	SAND AND GRAVEL-SAND AS ABOVE 50% GRAVEL RED GREEN GRAY BLACK 1/4 TO 2' SUBROUNDED UNCONSOLIDATED GRAVEL IS COMPOSED OF ARGILLITE AND QUARTZITE.
10	20	SAND AND GRAVEL-AS ABOVE VERY SILTY DRY GRAVEL 1/4 TO 1'
20	25	SAND AND GRAVEL-SAND BROWN FINE-COARSE GRAINED SILTY POORLY SORTED SUBANGULAR TO SUBROUNDED UNCONSOLIDATED CLAYEY IN PART VERY MOIST GRAVEL GREEN RED BLACK SUBROUNDED 1/4 TO 1-1/2IN CLASTS POSSIBLE A LITTLE PERCHED WATER IN THIS CLAYEY ZONE
25	30	SAND AND GRAVEL AS ABOVE SLIGHTLY MOIST
30	40	SAND-BROWN FINE-GRAINED 15% MEDIUM GRAINED SILTY TRACE CLAY WELL SORTED UNCONSOLIDATED 10% SMALL SUBROUNDED GRAVEL; CLASTS ARE 1/4-1/2IN IN SIZE DRY
40	60	SAND-GRAY BROWN FINE TO MEDIUM GRAINED VERY SILTY MODERATELY SORTED 10% COARSE GRAINED 10% SMALL GRAVEL SUBROUNDED UNCONSOLIDATED DRY HIT LARGE COBBLES AT 60' CUTTINGS FROM COBBLES ARE GREEN AND RED ARGILLITE.
60	73	SAND-GRAY LIGHT TAN FINE-GRAINED VERY SILTY 10% COARSE SAND AND FINE GRAVEL DRY UNCONSOLIDATED GRAVEL CLASTS ARE 1/4IN .
73	74	CLAY-BROWN STICKY VERY MOIST

74	80	SAND-GRAY FINE-GRAINED SILTY CLAYEY IN PART 10% COARSE SAND AND SMALL SUBROUNDED GRAVEL AS ABOVE UNCONSOLIDATED MOIST
80	85	SAND AND GRAVEL-TAN FINE-GRAINED 20% COARSE SAND A AND SMALL SUBROUNDED GRAVEL VERY SILTY UNCONSOLI- DATED MOIST
85	90	SAND-AS ABOVE 10% COARSE SAND AND SMALL GRAVEL VERY MOIST WATER AT APPROXIMATELY 90'.
90	100	SAND AND GRAVEL-TAN FINE-GRAINED SILTY 15% COARSE SUBANGULAR-SUBROUNDED GRAVEL; CLASTS ARE 1/4-1/2IN IN SIZE UNCONSOLIDATED HOLE IS MAKING WATER
100	114	SAND & GRAVEL SAND BROWN FINE GRAINED 15% MED TO COARSE GRAINED TRACE SILT CLAY MODERATELY SORTED MED TO COARSE GRAINED MATERIAL IS SUBROUNDED 15% GRAVEL RED GREEN BLACK SUBANGULAR TO SUBROUNDED CLASTS AR 1/4-1IN IN SIZE CLAST COMPOSITION IS

Driller Certification

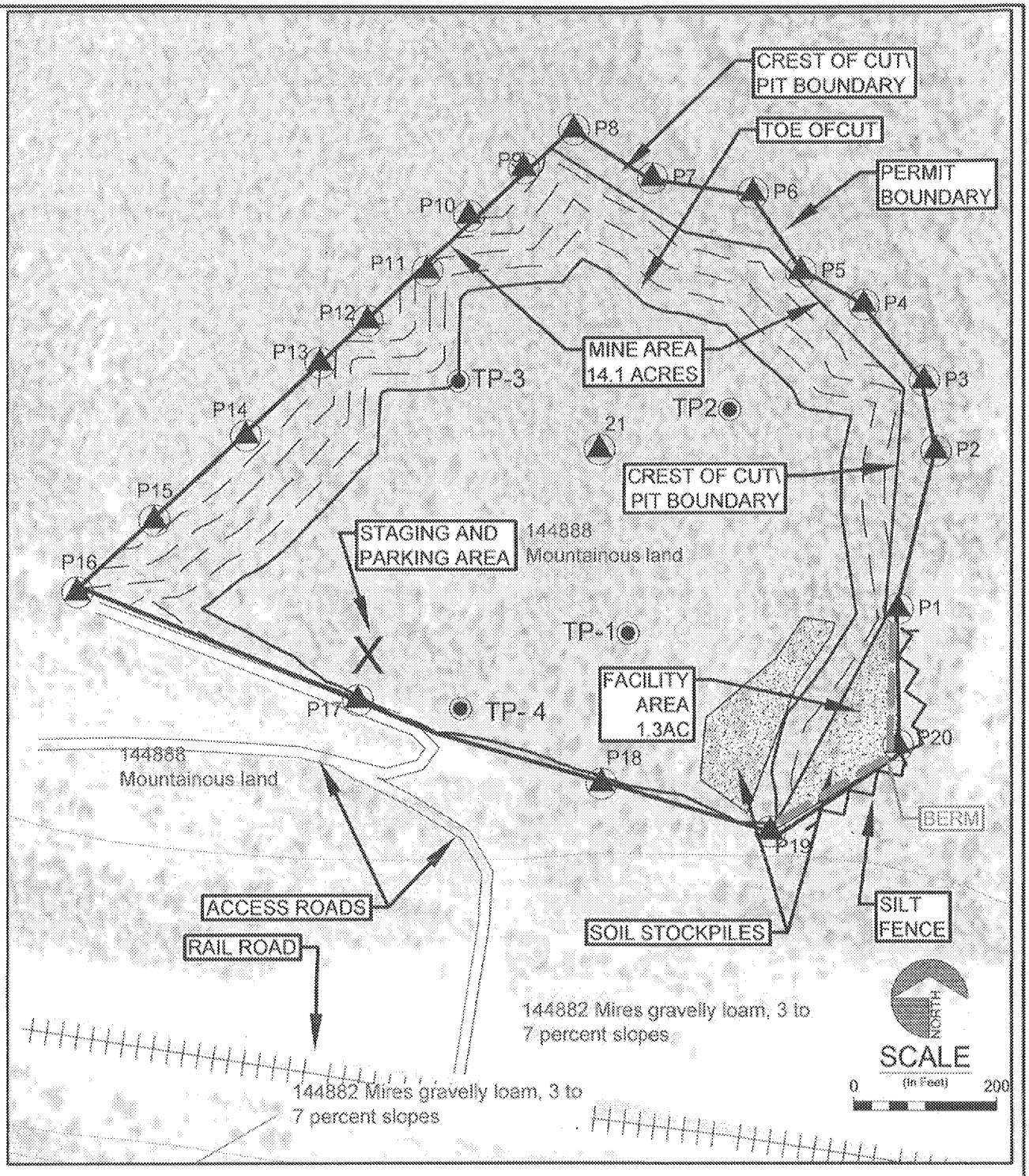
All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: WESTERN WATER WORKS INC
License No: -
Date Completed: 7/22/1993

HYDROMETRICS TEST HOLE LOG Helena, Mt

State: Montana	County: Flathead	Project: Columbia Falls Aluminum Plant	Hole Name: TH-19

From	To	DRILLING LOG Geological, Drilling, Water Conditions and Sampling
60	73	GRAV - Gray, light tan, fine-grained, very silty, 10% coarse sand and fine gravel, dry, unconsolidated, gravel clasts are 1/4".
73	74	CLAY - Brown, sticky, very moist.
74	80	SAND - Gray, fine-grained, silty, clayey in part, 10% coarse sand and small subrounded gravel, as above, unconsolidated, moist.
80	88	SAND AND GRAVEL - Tan, fine-grained, 20% coarse sand and small subrounded gravel, very silty, unconsolidated, moist.
88	90	SAND - As above, 10% coarse sand and small gravel, very moist, water at approximately 90'.
90	100	SOIL AND GRAVEL - Tan, fine-grained, silty, 15% coarse sand and subangular - subrounded gravel, gravel clasts are 1/4 - 1/2" in size, unconsolidated mix in making water.
100	116	SAND AND GRAVEL - Sand brown, fine-grained, 10% medium to coarse grained, trace silt clay, moderately sorted, medium to coarse grained material is subrounded, 15% gravel, red, green, black, subangular to subrounded, clasts are 1/4 - 1" in size, exact composition is argillite and basalt.



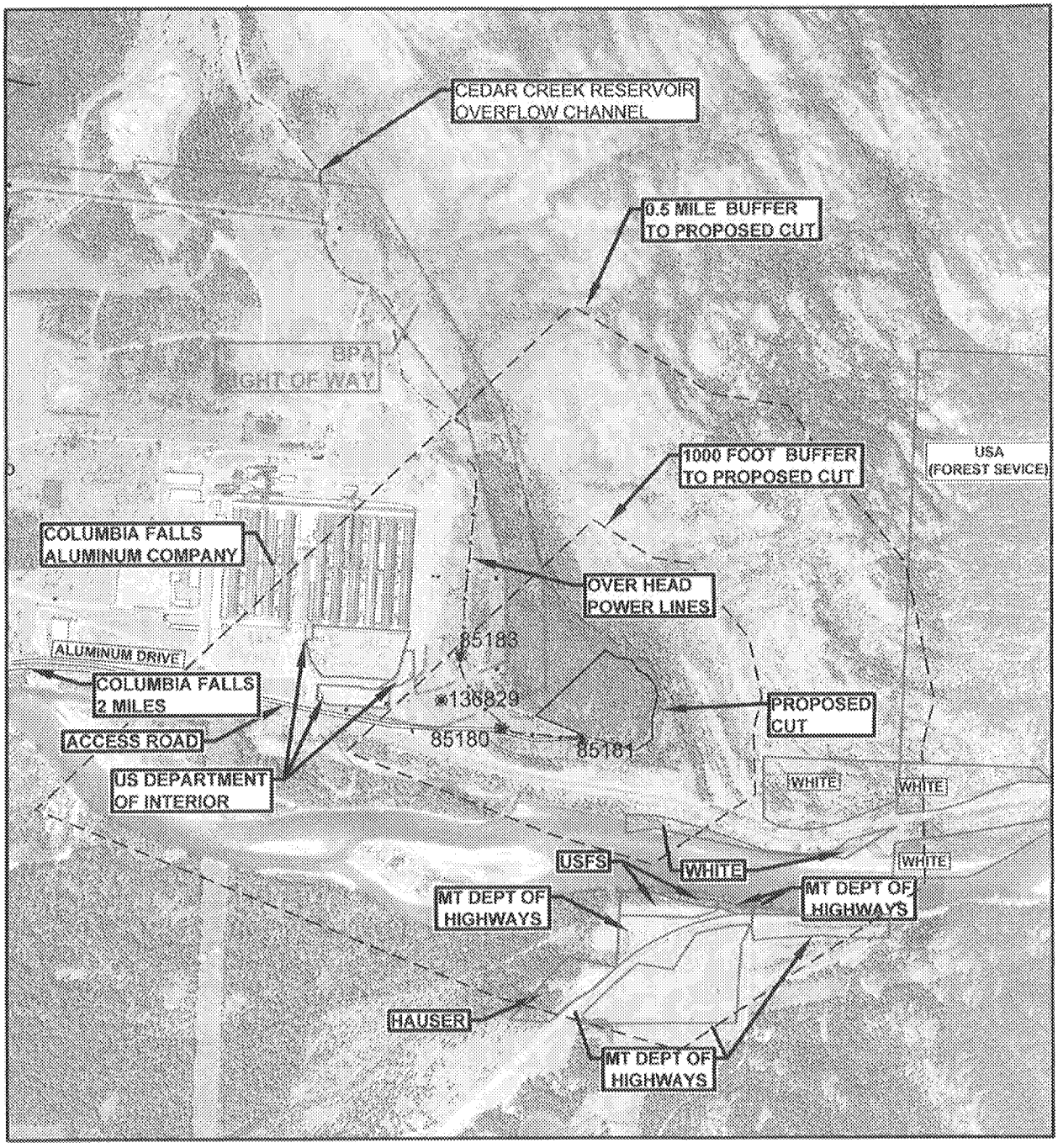
EXPLANATION

616075 Fluvents, alluvial fans	SOIL TYPE :SOURCE - SOIL SURVEY DATA FOR MONTANA, USDNRC: DOWNLOADED FEBRUARY 2015, NRIS	8▲	POINT ON PERMIT BOUNDARY
	SOIL TYPE BOUNDARY	— —	OPEN CUT CONTOUR 10 ft INTERVAL
TP-1◉	SOIL TEST PIT		

COLUMBIA FALLS ALUMINUM COMPANY OPEN CUT PERMIT APPLICATION	**COLUMBIA FALLS ALUMINUM COPMANY** **CFAC BORROW PIT SITE MAP** **S1/2 SEC2 T30N R20W**	FIGURE **2**

UPDATE TIME: 3:03 PM
\\JOHNSON\MSO\20150602\F:\DATA\CFAC\GRVL PRMT\14020 SITE.DWG

Hydrometrics, Inc.
Consulting Scientists and Engineers



EXPLANATION

85181 WELL

PROPERTY BOUNDARY:
ALL PROPERTY INSIDE 0.5 MILE BUFFER OWNED BY COLUMBIA FALLS ALUMINUM COMPANY UNLESS BORDER IS RED AND LABELED

TP2 SOIL TEST PIT

NORTH

SCALE
0 (In Feet) 1500

COLUMBIA FALLS ALUMINUM COMPANY OPEN CUT PERMIT APPLICATION	COLUMBIA FALLS ALUMINUM COMPANY CFAC BORROW PIT AREA MAP S1/2 SECTION 2, T30N, R20W	FIGURE 1

UPDATE TIME: 9:09 AM
\JOHNSON\MSO\20150610\E:\DATA\CFAC\CRVL PRMT\14020 AREA MAP.DWG

Hydrometrics, Inc.
Consulting Scientists and Engineers

PERMIT BOUNDARY COORDINATES TABLE

USED FOR PERMIT, AMENDMENT, REQUEST TO COMMENCE or RELEASE REQUESTS ONLY

Purpose of this Boundary Coordinate Form:

1) Use this form to submit coordinates to delineate a **Permit** or an **Amended Permit** boundary when submitting a **Permit or Amendment** application, **Request to Commence** form or **Release Request** table.

2) When providing coordinates for an **Amended** Permit boundary, you must include coordinates that delineate the ***entire*** proposed new boundary (i.e. existing permitted boundary plus proposed amendment area).

3) When submitting a **Release Request,** you must use this spreadsheet to provide coordinates of your existing or proposed "new" permit boundary in addition to the **Release Request Coordinate** table to provide coordinates for the proposed **Bond Reduction** and/or **Acreage Release** area(s).

4) If you will have **Bonded** and **Non-Bonded** area, complete the **Non-Bonded Boundary Coordinates** table - **in addition** to the ***Permit Boundary Coordinates*** table (i.e. this form).

5) Use this form to delineate Permitted Access Roads. When delineating permitted access roads, place the coordinates after the boundary coordinates and label them as "Access Road" in the "Description" column.

6) Coordinates **must** be in geographic sequence, so that the proposed permit boundary is created by connecting Map ID# P1 to Map ID #P2 to Map ID #P3, etc. The Map ID# for each coordinate must be shown on the site map or a separate BCT map (e.g. P1, P2, P3, etc.). Coordinates must be submitted in **Decimal Degrees** and **WGS 84** datum.

7) The "Longitude" column **must** contain negative numbers. Do not put anything but the coordinate in the Lat or Long boxes (i.e. no "N" or "W", etc.). Coordinates should be in this format Latitude 46.58946 & Longitude -112.00480

8) Email the completed Microsoft Excel table to: DEQopencut@mt.gov with "Subject" line: **BCT (Operator-Site Name)**. Do **not** include a printed version of this table with the paper application submitted to the Helena office.

Operator Name: COLUMBIA FALLS ALUMINUM COMPANY

Site Name: CFAC BORROW PIT

Permit # (if not a new app) | **Date:** 5/20/2015

MAP ID#	LATITUDE	LONGITUDE	DESCRIPTION (not required)
Center	48.39117729	-114.1210615	Approximate Center of Site
P1	48.38973385	-114.12000712	PERMIT BOUNDARY
P2	48.39030104	-114.11980966	PERMIT BOUNDARY
P3	48.39058851	-114.11997566	PERMIT BOUNDARY
P4	48.39092921	-114.12016364	PERMIT BOUNDARY
P5	48.39103283	-114.12057203	PERMIT BOUNDARY
P6	48.39117729	-114.12106154	PERMIT BOUNDARY
P7	48.39136597	-114.12171439	PERMIT BOUNDARY
P8	48.39149441	-114.12222564	PERMIT BOUNDARY
P9	48.39127476	-114.12257553	PERMIT BOUNDARY
P10	48.39108982	-114.12286019	PERMIT BOUNDARY
P11	48.39087354	-114.12309190	PERMIT BOUNDARY
P12	48.39067409	-114.12340537	PERMIT BOUNDARY
P13	48.39049659	-114.12367062	PERMIT BOUNDARY
P14	48.39021970	-114.12405840	PERMIT BOUNDARY
P15	48.38988643	-114.12454576	PERMIT BOUNDARY
P16	48.38960432	-114.12495725	PERMIT BOUNDARY
P17	48.38926177	-114.12333348	PERMIT BOUNDARY
P18	48.38901367	-114.12192531	PERMIT BOUNDARY
P19	48.38887569	-114.12090665	PERMIT BOUNDARY
P20	48.38915025	-114.12025422	PERMIT BOUNDARY
P21	48.39117729	-114.1210615	Approximate Center of Site
P22			
P23		-	

RECEIVED VIA OPENCUT E-MAIL 06/22/2015

COPY

Flathead County Weed Control District ~ 309 FFA Drive, Kalispell MT 59901
406.758.5798 fax 406.758.5888 Email: compliance@flathead.mt.gov

Soil Disturbance – Invasive Plant Management

Disturbed Areas, Subdivisions, Industrial Parks, Gravel Pits and/or Utility Installations

Instructions: Complete before disturbance begins and submit to the above address a minimum of two weeks prior to review deadline with Planning Board and/or Commissioners. A copy will be returned to you after it is reviewed in this office.

Subdivision/Project Name: CFAC Borrow Pit

Physical Location: Section 2 T30N R20W

Acres and # of Lots: 16 acres

Landowner's Name (PLEASE PRINT): Columbia Falls Aluminum Company

Mailing Address: 2000 Aluminum Dr.

City, State, Zip: Columbia Falls, MT 59912

Phone/Cell: 406 892 8211 Fax: 406 892 8201

Email: swright @ cfaluminum.com

Contact Name (PLEASE PRINT): Doug Parker

Mailing Address: 667 E Broadway

City, State, Zip: Missoula MT 59801

Phone/Cell: 406 721 8243 Fax: 406 542 2619

Email: dparker @ hydrometrics.com

Knowledge of the property's terrain, water table and soil type will aid in evaluation of methods needed for weed control. A perfect time for herbicide application is when weeds are young and actively growing but difficult to see. A reference map or drawing of weed locations is ideal to have on hand.

Indicate noxious weeds present: Spotted Knapweed

Disturbance cause:

___ Subdivision	___ Road Installation	___ Utility Installation
X Mining/Gravel	___ Ripping/Scraping	___ Excess Topsoil Stockpile
___ Other (please describe)		

Describe plans to reseed areas where original vegetation has been damaged, disturbed or removed, including phone, gas or power line burials, or power poles.

___ Site Preparation: soil replacement, regrading

___ Seed Varieties and Rates: native grass, forb & trees as approved by DEQ

___ Time of Seeding: spring / fall

___ Method of Seeding: broadcast; bare root seedlings

RECEIVED BY OPENCUT 07/17/2015

ED_002345B_00008304-00017

Flathead County Weed Control District – 309 FFA Drive, Kalispell MT 59901
406.758.5798 fax 406.758.5888 Email: compliance@flathead.mt.gov

Weed management methods:

_____Biocontrol Insects/Fungi
_____Cultivate
_____Graze, Sheep/Goats
_____Hand Pull
_X_Herbicides *list names below*
_____Landscape
_____Mow
_X_Revegetation/Reseed

Herbicides (list) Milestone, Transline, Curtail or determined by applicator

YEAR ONE Annual work to begin Month May Year 2015
YEAR TWO Annual work to begin Month May Year 2016
YEAR THREE Annual work to begin Month May Year 2017

Additional comments:

Other methods of weed management for disturbed area, subdivision, industrial park, gravel pit and/or utility installation:

_____Contract, conditions, covenants of subdivision sale to include weed treatment
_____Contractor required to maintain site weed free for a specified period of time
_____Develop road maintenance plan including weed control
_____Landscape
_X_Monitor site to ensure new weeds are promptly eradicated
_X_Reuse or remove excess topsoil
_____Wash equipment used in infested areas

Assignment of responsibility:

_X_Landowner (until all properties are sold)
_____Codes, Covenants & Restrictions
_____Commercial Applicator – Company Name/Contact/Phone
_____Homeowner's Association – Contact/Phone

I hereby agree to the plan as stated.

Landowner's Signature: Steve Wright Date: 5-1-2015
Envr Mgr Columbia Falls Aluminum

Approved (_/_) or Disapproved ( ) Flathead County Weed Board

Comments or amendments to the submitted plan as reviewed by the Flathead County Weed Board:

Signature of Board Representative Stan Cobbs Date 5.11.15

Agreed: Landowner's Signature Date

Columbia Falls Aluminum Company
CFAC Borrow Pit
Weed Management Plan

Columbia Falls Aluminum Company (CFAC) has proposed an open cut gravel operation in Section 2 (T30N R20W). The gravel pit (Figure 1) would encompass about 20 acres along the south flank of Teakettle Mountain within the CFAC industrial property. The area is adjacent to the aluminum plant industrial facilities and is presently forested.

The Flathead County Weed Board web site, lists 27 noxious weed species and an additional five species as special management zone weeds in Flathead County. CFAC is proposing a weed management plan to combat these infestations in the area of the proposed Open Cut permit.

A primary goal of noxious weed management for the gravel pit operations will be to reduce the opportunity to transport weeds on to and off from the site. Areas to be disturbed by mining will have approximately 24 inches of soil salvaged and stockpiled. Once mining is complete in an area, the mined area will be regraded to flat to gently sloping topography (no slopes greater than 3:1) and stockpiled soil will be re-spread and revegetated. Re-soiled areas will be seeded with a DEQ approved seed mix in the first appropriate season (spring or fall). If seeding/regeneration is not successful, the area or bare spots will be reseeded as necessary.

			Drill	Broadcast
Common Name	**Scientific Name**	**Variety**	(PLS Pounds per Acre)	
Western wheatgrass	*Agropyron smithii*	Rosana	2	4
Bluebunch wheatgrass	*Agropyron spicatum*	Goldar	2	4
Rough bentgrass	*Agrostis scabra*	----	0.1	0.2
Meadow brome	*Bromus biebersteinii*	MacBeth	3	6
Mountain brome	*Bromus marginatus*	Garnet	3	6
Tufted hairgrass	*Deschampsia caespitosa*	Nortran	0.25	0.5
Canada wildrye	*Elymus canadensis*	----	2	4
			12.35	24.7
Cover Crop				
Perennial ryegrass	*Lolium perenne*	Tonga	1	2
Cereal rye	*Secale cereale*	----	10	20
			11	22
Totals			23.35	46.70

CFAC will work with the Flathead County Weed Board to determine what types of controls will be used and the timing of control measures. To optimize the effectiveness of the weed control, CFAC will coordinate their weed control activities with those being carried out by Flathead County and any nearby control groups. The feasibility of using biological controls will continue to be reviewed. Mechanical and cultural control efforts, by themselves, generally, have not proven effective at containing or reducing widespread noxious weed infestations. Roadside mowing, generally, does not prevent knapweed from flowering and going to seed so mowing may not be a viable option. Herbicide application has proven to be the most effective control method for the weeds found in the vicinity of the project area.

The Weed Management Plan proposes the use of approved herbicides. By doing this, we can utilize the best approved treatment chemicals currently available to control the current noxious weeds. The types of herbicides to be used and the application rates will be determined by consultation of with the Flathead Weed Board and published data on herbicides. Parking and loading areas at the gravel operations will be kept noxious weed free to reduce potential transport off site.

The State of Montana licenses herbicide applicators. Applicators are required to keep records showing amount of herbicide applied and date of application. The State also is responsible for checking that applicators are adhering to requirements for record keeping, training and storage. CFAC personnel responsible for noxious weed treatment will assure that any contractors are licensed.

CFAC would require that all applicators adhere to safe application methods and practices, thus reducing the health risk to applicators and on site visitors, and protect sensitive vegetation and waterways. Applicators are required to follow requirements for storage, mixing, use, and disposal of herbicides that are listed on the label of every herbicide. The Environmental Protection Agency approves these requirements, and disregarding them is a violation of Federal and State laws.

Any high use areas where herbicides are used will be signed after spraying. Application rates would depend on the site, weed species, and control objectives and would not exceed label restrictions. All weed populations will be subject to a minimum of annual treatment.

Restoration seeding and appropriate fertilization will be conducted on disturbed sites as soon as seasonally appropriate when the disturbed sites are no longer needed for gravel pit activities. Revegetation seed mixes and practices outlined in the CFAC Reclamation Plan will be followed. Though reseeding is done principally to prevent erosion, it helps inhibit invasion of

disturbed sites by noxious weeds. Prompt revegetation will limit weed establishment and spread.

Personnel responsible for the weed control program will be trained to recognize noxious weeds and will be responsible for conducting the noxious weed survey on the project area or seeing that it is completed. Training will include plant identification using both photographic specimen examples and will be coordinated with the Flathead County Weed Board to take advantage of their resources. CFAC will maintain a list of declared noxious weeds in Montana along with descriptions and photographs at the gravel pit site. CFAC will maintain a general map of the locations of known weed infestations within the permit area. For some weeds, such as spotted knapweed which is ubiquitous, mapping will not likely be a useful tool except on newly reclaimed areas.

Permit area disturbances will be monitored to spot any new infestations. If any new weed species are discovered, the Flathead County Weed Board will be notified. CFAC will maintain a file documenting location and extent of weed infestations at the mine site. New infestations will be controlled at the first appropriate period following consultation the Weed Board.

Herbicide treatment areas will be documented and mapped annually. CFAC will record the locations of the weed treatments used for specific sites and information on any new sites. These records will be maintained at the evaluation adit site office and a summary report documenting new occurrences, treatment areas, plans for the next year's activities and other pertinent information will be submitted to agencies annually. Effectiveness of the various weed control measures will be evaluated and revisions made when necessary.

Reclamation Bond Spreadsheet

INSTRUCTIONS: Enter your data in the shaded boxes. See page 3 for detailed instructions.

Operator:	Columbia Falls Aluminium Company
Site:	CFAC Borrow Pit
Prepared by:	Doug Parker
Date:	5/28/2015

Total Permitted Acres = 15.4 **acres***

*Must match the "Total Permitted Acres" in A1-10 of the Opencut Mining Plan of Operation & Application.

Comments:

Pit area will be 14.1 acres. Highwall and berm will be excavated and graded to final 3:1 slope to minimize double handle of material and will leave outslope undisturbed. Initial timber removal and topsoil salvage will be done incrementally to minimize disturbed area until borrow material is needed. Soil stockpile on eastern edge of pit is approximately 0.4 acres. Additional permit area along northern boarder is 0.9 acres; this area will remain undisturbed, but is included in facility area for bonding purposes.

BONDED ACREAGE BREAKDOWN

Must match the "Bonded Acres" in section A1-11 of the Opencut Mining Plan of Operation & Application.

Mine Area	14.1	acres
Facility Area	1.3	acres
Access Road		acres
Bond Reduction Area		acres
Total Bonded Area =	15.4	acres**

**The Total Bonded Area must be identical to the Bond submitted by the Operator to the Department.

Highwall reduction, backfilling, soil and overburden replacement

Lineal Feet & Height must match section D3-8 of Opencut Mining Plan of Operation & Application

Highwall cut/fill (describe)	linear feet	height	slope ratio		cubic yards	
Cut wall	2,130	50	3	:1	73,958	total
				:1	0	73,958

Highwall Backfill (e.g. to reclaim highwalls that will not or cannot be cut and filled during mining, etc.)

Description	linear feet	height	slope ratio		cubic yards	
				:1	0	total
				:1	0	0

Mine Material Backfill (e.g. bringing offsite material to the site for backfill, etc.)

Description	acres	depth	compaction %	cubic yards	
				0	total
				0	0

Mine soil replacement	24	inches soil	Overburden Replacement	inches OB	total 24
Facility soil replacement		inches soil	* Soil and overburden inches much match section C2-2		0
Access road soil replacement		inches soil			total 0

ITEM	UNIT		AMOUNT		RATE		TOTAL
Highwalls and backfill			73,958	cu yds	$1	per cubic yard	$73,958
Mine area grading			14.1	acres	$200	per acre	$2,820
Mine area ripping			14.1	acres	$100	per acre	$1,410
Mine soil and OB replacement	24	inches	14.1	acres	$135	per inch/per acre	$45,684
Facility area grading			1.3	acres	$100	per acre	$130
Facility area ripping			1.3	acres	$100	per inch/per acre	$130
Facility soil replacement	0	inches	1.3	acres	$135	per inch/per acre	$0
Access road area grading			0.0	acres	$100	per acre	$0
Access road area ripping			0.0	acres	$100	per inch/per acre	$0
Access road soil replacement	0	inches	0.0	acres	$135	per inch/per acre	$0
Seeding or other revegetation			15.4	acres	$200	per acre	$3,080
Fencing				linear ft	$1	per linear foot	$0
Weed control			15.4	acres	$100	per acre	$1,540
Partially released acres			0.0	acres	$300	per acre	$0
Cost to crush onsite asphalt				cu yds	$4	per cubic yard	$0
Cost to Purchase and Place Importation of Soil/Fill				cu yds	$15	per cubic yard	$0
Cost to Bond for Reject Fines				cu yds	$1	per cubic yard	$0
							$0
							$0
							$0
Estimated Mobilization cost to move equipment to the site (DEQ's cost):					$3,000		$3,000
Estimated Administration Costs = 10% of total bond cost or $5,000 (whichever is greater)					$13,175		$13,175

Total Area Bonded = 15.4 Rate Per Bonded Acre = $9,410.88 **TOTAL BOND = $144,928**

TP-1 CFAC Soil Pit - TP1 0-24"

TP-1
200ft N of boundary point 7
Slope 5-10%
Larch over story, mountain maple, service berry, ninebark, oregon grape, pine grass, moss

0-1 needle litter

1-3 silty loam; numerous fine roots; 20% gravel& cobble (rounded); 10YR2/1 wet

3-10 silty, clayey sand; numerous fine and common coarse roots; 50% gravel & cobble (rounded); 10YR 4/4 wet

10-26 silty, sandy clay; slightly sticky; few coarse roots; 50% gravel and cobbles; cobbles to 8" subrounded/rounded; 10YR6/6 wet